

REMARKS/ARGUMENTS

Applicants respectfully request reconsideration of this application in view of the present amendments and the following remarks. By this amendment, Claims 1, 12 and 22 are amended, and Claim 17 is canceled. Moreover, the status identifier for claims 2-4, 8 and 21 has been revised to correctly identify the claims as having been "previously presented." As a result, upon entry of this amendment Claims 1-5, 8, 12, 21 and 22 are pending in this case, with Claims 1 and 22 being independent claims. Because the application as originally filed contained 8 independent claims and 50 total claims (including multiple dependencies), and now contains only 2 independent claims and 18 total claims (including multiple dependencies and excluding non-elected claims), it is believed that no additional fees are due for the consideration of this paper. However, if additional fees are due, the Commissioner is authorized to charge such fees to deposit account number 13-2855. A copy of this paper is enclosed.

Claim Amendments

Claims 1 and 22 are amended hereby to recite controllers for the ion plating devices and controlling the ion plating devices to implement the preliminary plasma forming process and the film forming process previously recited in canceled claim 17. The controller for the ion plating device is disclosed in the present application as originally filed at least at page 18, line 20 through page 19, line 2. Claim 12 is amended to delete redundant limitations of Claim 1 as amended from which Claim 12 depends. Consequently, Applicants respectfully submit that no new matter is presented by the amendment, and respectfully request entry of the amendment.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-5, 8, 12, 17, 21 and 22 were rejected under 35 U.S.C. § 103(a) as being obvious over the admitted prior art of Figure 4 in view of Gorin (U.S. Patent No. 4,464,223), either alone or further in view of Okano et al. (JP 56-81678 A), White (U.S. Patent No. 4,039,416), Yao et al. (U.S. Patent No. 6,051,114) or Kofugi et al. (U.S. Patent No. 6,231,777). Applicants respectfully submit that pending Claims 1-5, 8, 12, 21 and 22 are not properly rejectable over the applied references for the following reasons. Claims 1 and 22 as

amended recite an ion plating device having, *inter alia*, a controller controlling the ion plating device to perform a preliminary plasma forming process with the bias voltage output with a cycle set in the range of 1 kHz to 1 GHz, and to perform a film forming process with the bias voltage output with a cycle set in a range of 1 MHz to 1 GHz. None of the cited references disclose or suggest an ion plating device having a controller and performing two processes as recited in claims 1 and 22.

As admitted in the Office action, the admitted prior art alone does not recite all the limitations of the claims. Applicants respectfully submit that the remaining references fail to provide the necessary limitations missing from the admitted prior art. Regarding Gorin, the reference describes a plasma reactor having two electrodes, one with a 100 KHz AC frequency and one with a 13.56 MHz AC frequency. One or both of the electrodes may be energized as desired based on the materials used, but Gorin does not disclose or suggest a preliminary plasma forming process using the low frequency electrode and a film forming process using the high frequency electrode. The examples in Gorin each disclose a single process wherein either the low frequency electrode, the high frequency electrode, or both are energized. Moreover, Gorin neither discloses or suggests having a controller controlling any processes in the plasma reactor. Additionally, the Okano reference does not appear to disclose either a controller in its apparatus or multiple process steps having bias voltages output within different frequency ranges as recited in the claims. As a result, no combination of the admitted prior art, Gorin and Okano render Claims 1-5, 8, 12, 21 and 22 anticipated or obvious.

Regarding the White reference, White does not disclose or suggest providing a controller to control the gasless ion plating process. Further, White discloses applying a 450 kHz power supply to create a plasma, and a 13.5 MHz power supply to bias the substrate, but does not appear to disclose or suggest doing so as separate processes during the plating operation. Consequently, White also does not provide the disclosure or suggestion of a controller and multiple processes with different bias voltage output frequency ranges as recited in the pending claims.



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The Yao et al. reference discloses a CPU for an Electron Cyclotron Resonance (ECR) reactor having pressure control and plasma control routines, but does not disclose or suggest multiple processes with different bias voltage output frequency ranges as recited in the pending claims. Finally, the Kofuji et al. reference does not disclose or suggest controlling an etching process with a controller. In one embodiment (See Fig. 32 and accompanying text), Kofuji et al. discloses increasing the frequency of a pulse from 10 kHz to 10 MHz during the etching of the substrate, but does not disclose or suggest a preliminary plasma forming process, whether controlled by a controller or not, wherein the bias voltage is output with a cycle set in a different frequency range than during the etching process. As a result, the Yao et al. and Kofuji et al. references also do not provide the necessary disclosure or suggestion of a controller and controller processes with different with different bias voltage output frequency ranges missing from the admitted prior art. Because no combination of the admitted prior art and the cited references appear to result in the limitations recited in the currently pending claims, it is respectfully submitted that Claims 1-5, 8, 12, 21 and 22 are neither anticipated nor rendered obvious, and applicants respectfully request an indication that the claims are allowable at the Examiner's earliest convenience.

For at least the foregoing reasons, reconsideration and withdrawal of the rejection of the claims and allowance of the currently pending claims are respectfully requested. Should the Examiner wish to discuss the foregoing or any matter of form in an effort to advance this application towards allowance, she is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

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